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YOUNG & THOMPSON  
209 Madison Street  
Suite 500  
Alexandria, VA 22314

EXAMINER
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CHAWAN, VIJAY B

ART UNIT	PAPER NUMBER
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2626

NOTIFICATION DATE	DELIVERY MODE
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12/11/2009

ELECTRONIC

**Please find below and/or attached an Office communication concerning this application or proceeding.**

The time period for reply, if any, is set in the attached communication.

Notice of the Office communication was sent electronically on above-indicated "Notification Date" to the following e-mail address(es):

DocketingDept@young-thompson.com

<b>Office Action Summary</b>	<b>Application No.</b> 10/594,396	<b>Applicant(s)</b> EN-NAJJARY ET AL.	
	<b>Examiner</b> Vijay B. Chawan	<b>Art Unit</b> 2626	

-- The MAILING DATE of this communication appears on the cover sheet with the correspondence address --

#### Period for Reply

A SHORTENED STATUTORY PERIOD FOR REPLY IS SET TO EXPIRE 3 MONTH(S) OR THIRTY (30) DAYS, WHICHEVER IS LONGER, FROM THE MAILING DATE OF THIS COMMUNICATION.

- Extensions of time may be available under the provisions of 37 CFR 1.136(a). In no event, however, may a reply be timely filed after SIX (6) MONTHS from the mailing date of this communication.
- If NO period for reply is specified above, the maximum statutory period will apply and will expire SIX (6) MONTHS from the mailing date of this communication.
- Failure to reply within the set or extended period for reply will, by statute, cause the application to become ABANDONED (35 U.S.C. § 133). Any reply received by the Office later than three months after the mailing date of this communication, even if timely filed, may reduce any earned patent term adjustment. See 37 CFR 1.704(b).

#### Status

- 1) ☒ Responsive to communication(s) filed on 26 September 2006.
- 2a) ☐ This action is **FINAL**.                      2b) ☒ This action is non-final.
- 3) ☐ Since this application is in condition for allowance except for formal matters, prosecution as to the merits is closed in accordance with the practice under *Ex parte Quayle*, 1935 C.D. 11, 453 O.G. 213.

#### Disposition of Claims

- 4) ☒ Claim(s) 20-37 is/are pending in the application.
- 4a) Of the above claim(s) \_\_\_\_\_ is/are withdrawn from consideration.
- 5) ☐ Claim(s) \_\_\_\_\_ is/are allowed.
- 6) ☒ Claim(s) 20-38 is/are rejected.
- 7) ☐ Claim(s) \_\_\_\_\_ is/are objected to.
- 8) ☐ Claim(s) \_\_\_\_\_ are subject to restriction and/or election requirement.

#### Application Papers

- 9) ☐ The specification is objected to by the Examiner.
- 10) ☐ The drawing(s) filed on \_\_\_\_\_ is/are: a) ☐ accepted or b) ☐ objected to by the Examiner.  
Applicant may not request that any objection to the drawing(s) be held in abeyance. See 37 CFR 1.85(a).  
Replacement drawing sheet(s) including the correction is required if the drawing(s) is objected to. See 37 CFR 1.121(d).
- 11) ☐ The oath or declaration is objected to by the Examiner. Note the attached Office Action or form PTO-152.

#### Priority under 35 U.S.C. § 119

- 12) ☒ Acknowledgment is made of a claim for foreign priority under 35 U.S.C. § 119(a)-(d) or (f).
- a) ☒ All    b) ☐ Some \*    c) ☐ None of:
1. ☒ Certified copies of the priority documents have been received.
2. ☐ Certified copies of the priority documents have been received in Application No. \_\_\_\_\_.
3. ☐ Copies of the certified copies of the priority documents have been received in this National Stage application from the International Bureau (PCT Rule 17.2(a)).

\* See the attached detailed Office action for a list of the certified copies not received.

#### Attachment(s)

- |   |   |
|---|---|
| 1) <input checked="" type="checkbox"/> Notice of References Cited (PTO-892)   | 4) <input type="checkbox"/> Interview Summary (PTO-413)<br>Paper No(s)/Mail Date. _____ |
| 2) <input type="checkbox"/> Notice of Draftperson's Patent Drawing Review (PTO-948)                                   | 5) <input type="checkbox"/> Notice of Informal Patent Application                       |
| 3) <input checked="" type="checkbox"/> Information Disclosure Statement(s) (PTO/SB/08)<br>Paper No(s)/Mail Date _____ | 6) <input type="checkbox"/> Other: _____  |

## **DETAILED ACTION**

### ***Specification***

1. The following guidelines illustrate the preferred layout for the specification of a utility application. These guidelines are suggested for the applicant's use.

#### **Arrangement of the Specification**

As provided in 37 CFR 1.77(b), the specification of a utility application should include the following sections in order. Each of the lettered items should appear in upper case, without underlining or bold type, as a section heading. If no text follows the section heading, the phrase "Not Applicable" should follow the section heading:

- (a) TITLE OF THE INVENTION.
- (b) CROSS-REFERENCE TO RELATED APPLICATIONS.
- (c) STATEMENT REGARDING FEDERALLY SPONSORED RESEARCH OR DEVELOPMENT.
- (d) THE NAMES OF THE PARTIES TO A JOINT RESEARCH AGREEMENT.
- (e) INCORPORATION-BY-REFERENCE OF MATERIAL SUBMITTED ON A COMPACT DISC.
- (f) BACKGROUND OF THE INVENTION.
  - (1) Field of the Invention.
  - (2) Description of Related Art including information disclosed under 37 CFR 1.97 and 1.98.
- (g) BRIEF SUMMARY OF THE INVENTION.
- (h) BRIEF DESCRIPTION OF THE SEVERAL VIEWS OF THE DRAWING(S).
- (i) DETAILED DESCRIPTION OF THE INVENTION.
- (j) CLAIM OR CLAIMS (commencing on a separate sheet).
- (k) ABSTRACT OF THE DISCLOSURE (commencing on a separate sheet).
- (l) SEQUENCE LISTING (See MPEP § 2424 and 37 CFR 1.821-1.825. A "Sequence Listing" is required on paper if the application discloses a nucleotide or amino acid sequence as defined in 37 CFR 1.821(a) and if the required "Sequence Listing" is not submitted as an electronic document on compact disc).

#### **Content of Specification**

- (a) Title of the Invention: See 37 CFR 1.72(a) and MPEP § 606. The title of the invention should be placed at the top of the first page of the

Art Unit: 2626

specification unless the title is provided in an application data sheet. The title of the invention should be brief but technically accurate and descriptive, preferably from two to seven words may not contain more than 500 characters.

- (b) Cross-References to Related Applications: See 37 CFR 1.78 and MPEP § 201.11.
- (c) Statement Regarding Federally Sponsored Research and Development: See MPEP § 310.
- (d) The Names Of The Parties To A Joint Research Agreement: See 37 CFR 1.71(g).
- (e) Incorporation-By-Reference Of Material Submitted On a Compact Disc: The specification is required to include an incorporation-by-reference of electronic documents that are to become part of the permanent United States Patent and Trademark Office records in the file of a patent application. See 37 CFR 1.52(e) and MPEP § 608.05. Computer program listings (37 CFR 1.96(c)), "Sequence Listings" (37 CFR 1.821(c)), and tables having more than 50 pages of text were permitted as electronic documents on compact discs beginning on September 8, 2000.
- (f) Background of the Invention: See MPEP § 608.01(c). The specification should set forth the Background of the Invention in two parts:
  - (1) Field of the Invention: A statement of the field of art to which the invention pertains. This statement may include a paraphrasing of the applicable U.S. patent classification definitions of the subject matter of the claimed invention. This item may also be titled "Technical Field."
  - (2) Description of the Related Art including information disclosed under 37 CFR 1.97 and 37 CFR 1.98: A description of the related art known to the applicant and including, if applicable, references to specific related art and problems involved in the prior art which are solved by the applicant's invention. This item may also be titled "Background Art."
- (g) Brief Summary of the Invention: See MPEP § 608.01(d). A brief summary or general statement of the invention as set forth in 37 CFR 1.73. The summary is separate and distinct from the abstract and is directed toward the invention rather than the disclosure as a whole. The summary may point out the advantages of the invention or how it solves problems

Art Unit: 2626

previously existent in the prior art (and preferably indicated in the Background of the Invention). In chemical cases it should point out in general terms the utility of the invention. If possible, the nature and gist of the invention or the inventive concept should be set forth. Objects of the invention should be treated briefly and only to the extent that they contribute to an understanding of the invention.

- (h) Brief Description of the Several Views of the Drawing(s): See MPEP § 608.01(f). A reference to and brief description of the drawing(s) as set forth in 37 CFR 1.74.
- (i) Detailed Description of the Invention: See MPEP § 608.01(g). A description of the preferred embodiment(s) of the invention as required in 37 CFR 1.71. The description should be as short and specific as is necessary to describe the invention adequately and accurately. Where elements or groups of elements, compounds, and processes, which are conventional and generally widely known in the field of the invention described and their exact nature or type is not necessary for an understanding and use of the invention by a person skilled in the art, they should not be described in detail. However, where particularly complicated subject matter is involved or where the elements, compounds, or processes may not be commonly or widely known in the field, the specification should refer to another patent or readily available publication which adequately describes the subject matter.
- (j) Claim or Claims: See 37 CFR 1.75 and MPEP § 608.01(m). The claim or claims must commence on separate sheet or electronic page (37 CFR 1.52(b)(3)). Where a claim sets forth a plurality of elements or steps, each element or step of the claim should be separated by a line indentation. There may be plural indentations to further segregate subcombinations or related steps. See 37 CFR 1.75 and MPEP § 608.01(i)-(p).
- (k) Abstract of the Disclosure: See MPEP § 608.01(f). A brief narrative of the disclosure as a whole in a single paragraph of 150 words or less commencing on a separate sheet following the claims. In an international application which has entered the national stage (37 CFR 1.491(b)), the applicant need not submit an abstract commencing on a separate sheet if an abstract was published with the international application under PCT Article 21. The abstract that appears on the cover page of the pamphlet published by the International Bureau (IB) of the World Intellectual Property Organization (WIPO) is the abstract that will be used by the USPTO. See MPEP § 1893.03(e).
- (l) Sequence Listing. See 37 CFR 1.821-1.825 and MPEP §§ 2421-2431. The requirement for a sequence listing applies to all sequences disclosed

in a given application, whether the sequences are claimed or not. See MPEP § 2421.02.

2. The disclosure is objected to because of the following informalities: The disclosure as presented is all one document. The above guideline is provided to the applicant to follow as to the arrangement and content of the specification.

Appropriate correction is required.

3. Claims 1-19 were canceled by the amendment filed 9/26/2006. Pending claims are 20-37.

### ***Claim Objections***

4. Claim 33 is objected to because of the following informalities: Claim 33 depends upon "...claim 28 in conjunction with claim 13...". Claim 13 had been cancelled with the correspondence filed 9/26/09. Examiner assumes that claim 13 was a typographical error, and therefore, claim 33 is treated as being dependent upon claim 28 alone.

Appropriate correction is required.

### ***Claim Rejections - 35 USC § 102***

5. The following is a quotation of the appropriate paragraphs of 35 U.S.C. 102 that form the basis for the rejections under this section made in this Office action:

A person shall be entitled to a patent unless –

Art Unit: 2626

(b) the invention was patented or described in a printed publication in this or a foreign country or in public use or on sale in this country, more than one year prior to the date of application for patent in the United States.

6. Claims 20-38 are rejected under 35 U.S.C. 102(b) as being anticipated by Duxans et al., ("Estimation of GMM in voice conversion including unaligned data", Proceedings of Eurospeech 2003 Conference, September 2003, pages 861-864).

As per claim 20, Duxans et al., teach a method of converting a voice signal as spoken by a source speaker into a converted voice signal the acoustic characteristics thereof resemble those of a target speaker, the method comprising: a determination step of determining a function for transforming acoustic characteristics of the source speaker into acoustic characteristics close to those of the target speaker on the basis of samples of the voices of the source and target speakers, and a transformation step of transforming acoustic characteristics of the source speaker voice signal to be converted by applying said transformation function, wherein said determination step comprises a step of determining a function for conjoint transformation of characteristics of the source speaker relating to the spectral envelope and of characteristics of the source speaker relating to the pitch and in that said transformation step comprises applying said conjoint transformation function (Introduction, Sections 2 and 3).

As per claim 21, Duxans et al., teach the method according to claim 20, wherein said step of determining a conjoint transformation function comprises: a step of analyzing source and target speaker voice samples grouped into frames to obtain for each frame information relating to the spectral envelope and to the pitch, a step of concatenating information relating to the spectral envelope and information relating to the pitch for each of the source and target speakers, a step of determining a model

Art Unit: 2626

representing common acoustic characteristics of source speaker and target speaker voice samples, and a step of determining said conjoint transformation function from said model and the voice samples (Introduction, Sections 2 and 3).

As per claim 22, Duxans et al., teach the method according to claim 21, wherein said steps of analyzing the source and target speaker voice samples are adapted to produce said information relating to the spectral envelope in the form of cepstral coefficients (Introduction, Sections 2 and 3).

As per claim 23, Duxans et al., teach the method according to claim 21, wherein said analysis steps comprise respectively a step of achieving voice samples models as a summation of an harmonic signal and noise, each achieving step comprising: a substep of estimating the pitch of the voice samples, a substep of synchronized analysis of the pitch of each frame, and a substep of estimating spectral envelope parameters of each frame (Introduction, Sections 2 and 3).

As per claim 24, Duxans et al., teach the method according to claim 21, wherein said step of determining a model determines a Gaussian probability density mixture model (Introduction, Sections 2 and 3).

As per claim 25, Duxans et al., teach the method according to claim 24, wherein said step of determining a model comprises: a substep of determining a model corresponding to a mixture of Gaussian probability densities, and a substep of estimating parameters of the mixture of Gaussian probability densities from an estimated maximum likelihood between the acoustic characteristics of the source and target speaker samples and the model (Introduction, Sections 2 and 3).



As per claim 26, Duxans et al., teach the method according to claim 21, wherein said step of determining at least one transformation function further includes a step of normalizing the pitch of the frames of source and target speaker samples relative to average values of the pitch of the analyzed source and target speaker samples (Introduction, Sections 2 and 3).

As per claim 27, Duxans et al., teach the method according to claim 21, including a step of temporally aligning the acoustic characteristics of the source speaker with the acoustic characteristics of the target speaker, this step being executed before said step of determining a conjoint model (Introduction, Sections 2 and 3).

As per claim 28, Duxans et al., teach the method according to claim 20, including a step of separating voiced frames and non-voiced frames in the source speaker and target speaker voice samples, said step of determining a conjoint transformation function of the characteristics relating to the spectral envelope and to the pitch being based only on said voiced frames and the method including a step of determining a function for transformation of only the spectral envelope characteristics on the basis only of said non-voiced frames (Introduction, Sections 2 and 3).

As per claim 29, Duxans et al., teach the method according to claim 20, wherein said step of determining at least one transformation function comprises only said step of determining a conjoint transformation function (Introduction, Sections 2 and 3).

As per claim 30, Duxans et al., teach the method according to claim 20, wherein said step of determining a conjoint transformation function is achieved on the basis of an estimate of the acoustic characteristics of the target speaker, the achievement of the

Art Unit: 2626

acoustic characteristics of the source speaker being known (Introduction, Sections 2 and 3).

As per claim 31, Duxans et al., teach the method according to claim 30, wherein said estimate is the conditional expectation of the acoustic characteristics of the target speaker the achievement of the acoustic characteristics of the source speaker being known (Introduction, Sections 2 and 3).

As per claim 32, Duxans et al., teach the method according to claim 20, wherein said step of transforming acoustic characteristics of the voice signal to be converted includes: a step of analyzing said voice signal, grouped into frames, to obtain for each frame information relating to the spectral envelope and to the pitch, a step of formatting the acoustic information relating to the spectral envelope and to the pitch of the voice signal to be converted, and a step of transforming the formatted acoustic information of the voice signal to be converted using said conjoint transformation function (Introduction, Sections 2 and 3).

As per claim 33, Duxans et al., teach the method according to claim 28, including a step of separating voiced frames and non-voiced frames in the source speaker and target speaker voice samples, said step of determining a conjoint transformation function of the characteristics relating to the spectral envelope and to the pitch being based entirely on said voiced frames and the method including a step of determining a function for transformation of only the spectral envelope characteristics on the basis only of said non-voiced frames, and including a step of separating voiced frames and non-voiced frames in said voice signal to be converted, said transformation step

Art Unit: 2626

comprising: a substep of applying said conjoint transformation function only to voiced frames of said signal to be converted, and a substep of applying said transformation function of the spectral envelope characteristics only to non-voiced frames of said signal to be converted (Introduction, Sections 2 and 3).

As per claim 34, Duxans et al., teach the method according to claim 32, wherein said step of determining a transformation function comprises only said step of determining a conjoint transformation function, and wherein said transformation step comprises applying said conjoint transformation function to the acoustic characteristics of all the frames of said voice signal to be converted (Introduction, Sections 2 and 3).

As per claim 35, Duxans et al., teach the method according to claim 20, further including a step of synthesizing a converted voice signal from said transformed acoustic information (Introduction, Sections 2 and 3).

As per claim 36 Duxans et al., teach a system for converting a voice signal as spoken by a source speaker into a converted voice signal the acoustic characteristics thereof resemble ones of a target speaker, the system comprising: means for determining at least one function for transforming acoustic characteristics of the source speaker into acoustic characteristics similar to ones of the target speaker on the basis of voice samples as spoken by the source and target speakers, and means for transforming acoustic characteristics of the source speaker voice signal to be converted by applying said transformation function, wherein said means for determining at least one transformation function comprise a unit for determining a function for conjoint transformation of characteristics of the source speaker relating to the spectral envelope

Art Unit: 2626

and of characteristics of the source speaker relating to the pitch and in that said transformation means include for applying said conjoint transformation function (Introduction, Sections 2 and 3).

As per claim 37, Duxans et al., teach the system according to claim 36, further including: means for analyzing the voice signal to be converted, adapted to produce information relating to the spectral envelope and to the pitch of the voice signal to be converted, and synthesizer means for forming a converted voice signal from at least said spectral envelope and pitch information transformed simultaneously (Introduction, Sections 2 and 3).

As per claim 38, Duxans et al., teach the system according to claim 36, wherein said means for determining an acoustic characteristic transformation function further include a unit for determining at least one transformation function for the spectral envelope of non-voiced frames, said unit for determining the conjoint transformation function being adapted to determine the conjoint transformation function only for voiced frames (Introduction, Sections 2 and 3).

### ***Conclusion***

7. The prior art made of record and not relied upon is considered pertinent to applicant's disclosure. Please see attached form PTO-892.

Art Unit: 2626

Any inquiry concerning this communication or earlier communications from the examiner should be directed to Vijay B. Chawan whose telephone number is (571) 272-7601. The examiner can normally be reached on Monday Through Friday 6:30-3:00.

If attempts to reach the examiner by telephone are unsuccessful, the examiner's supervisor, Richemond Dorvil can be reached on (571) 272-7602. The fax phone number for the organization where this application or proceeding is assigned is (571) 273-8300.

Information regarding the status of an application may be obtained from the Patent Application Information Retrieval (PAIR) system. Status information for published applications may be obtained from either Private PAIR or Public PAIR. Status information for unpublished applications is available through Private PAIR only. For more information about the PAIR system, see <http://pair-direct.uspto.gov>. Should you have questions on access to the Private PAIR system, contact the Electronic Business Center (EBC) at 866-217-9197 (toll-free).

/Vijay B. Chawan/  
Primary Examiner, Art Unit 2626

vbc  
12/9/09